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Congenital Cardiology Solutions

THE PREVALENCE OF ARRHYTHMIAS DURING EXERCISE TESTING IN CHILDREN

Poster Contributions
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Background: Exercise testing is commonly performed in children for evaluation of cardiac disease. There are few data on the prevalence and types of arrhythmias observed during exercise testing in children.

Methods: A retrospective review of all patients < 21 years of age undergoing exercise testing at our center from 2008 - 2012 was performed. Patient demographics, hx of arrhythmias, echo findings, exercise data, arrhythmias during testing and interventions required were recorded. Chi-square was used for dichotomous variables, ANOVA for continuous data. $P < 0.05$ was considered significant.

Results: 1,037 tests were performed in 916 patients. Mean age was 14 ± 4 years, 537 (55%) were male, 281 (27%) had congenital heart disease (CHD), 178 (17%) had a hx of a prior arrhythmia or rhythm disorder, and 17 (2%) had a pacemaker. Testing was on the treadmill in 677 (65%), the bike in 360 (35%), and with cardio-pulmonary assessment in 400 (40%). The main indications for testing were: Chest pain/palpitations 319 (31%), CHD 281 (27%), arrhythmia hx 148 (14%), and syncope 108 (10%). The most common forms of CHD were: TOF 54 (5.2%), single ventricle 49 (4.7%) and aortic valve dx 36 (3.5%). 291 (28%) patients had a rhythm disturbance during the procedure, the most common being PVCs in 192 (19%) and PACs 53 (5%). Clinically important arrhythmias were noted in 34 (3%) patients and included: 19 (1.8%) increasing ectopy with exercise, 5 (0.5%) VT, 5 (0.5%) second degree AV block, 3 (0.3%) SVT, and 2 (0.2%) AFIB. All arrhythmias spontaneously resolved and none of the patients required cardioversion or acute anti-arrhythmic therapy. Variables associated with the development of a clinically relevant arrhythmia included: severe left ventricular (LV) dysfunction on echo ($p<0.001$) and a prior history of a documented arrhythmia or arrhythmia disorder (e.g. LQTS, $p<0.001$). There were no complications or adverse events related to testing.

Conclusions: A total of 29% of children developed a rhythm disturbance during exercise testing and 3% were clinically important. Severe LV dysfunction and a history of documented arrhythmia or arrhythmia disorder were associated with the development of a clinically important arrhythmia in children.